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SPACE BEACON

Stay up-to-date with the latest in spacetech



Conquer the Cosmic Unknown

INDIAN TECHNOLOGY CONGRESS ASSOCIATION

Orbital

Lead with the most significant celestial events or discoveries

Missy Elliott's Music Blasts Off to Venus

In a historic first, NASA beamed Missy Elliott's iconic "The Rain (Supa Dupa Fly)" to Venus. This interstellar serenade traveled 158 million miles, reaching the planet in a cosmic melody. NASA's Deep Space Network, renowned for its role in planetary exploration, made this groundbreaking transmission possible.

The collaboration between art and science celebrates human ingenuity and our endless quest to explore the cosmos.



Solar Storm Sparks Orbital Traffic Jam: Satellites Scramble in Space's Biggest Exodus

In May 2024, a solar superstorm triggered a "mass migration" in space, forcing thousands of satellites to adjust their orbits as they descended toward Earth at 590 feet per day. This G5-intensity event revealed vulnerabilities in space infrastructure and highlighted the challenges of managing over 10,000 satellites in low Earth orbit. While the storm cleared some space debris, it underscored the urgent need for space situation analysis with improved space weather prediction and traffic management, especially with solar activity expected to peak in 2025.



Cosmic Crisis Management: Chinese Astronauts Ace Space Station Emergency Drill

A space debris collision and pressure loss simulation was carried out by the Shenzhou XVIII crew on China's Tiangong space station as part of an emergency practice. Under the direction of Senior Colonel Ye Guangfu, the group showed that they were prepared for eventualities by promptly locating and caulking fake leaks. They have carried out two spacewalks, equipment replacements, and mental health assessments since launch on April 25.

As they approach the halfway point of their mission, China's space exploration capabilities and commitment to astronaut safety will be tested in the coming days.



Earth's Watchdogs: How Tech Is Catching Climate Cheats



In the high-stakes game of climate change, some players have been bluffing. But the era of unchecked environmental promises is coming to an end, thanks to an unlikely alliance: satellites and artificial intelligence.

These space-age sleuths are exposing the stark reality behind climate pledges. Oil giants, it turns out, are spewing 16 times more methane than they admit. Meanwhile, in the Amazon, only 96% of forest conservation projects are actually delivering on their green promises. But here's the kicker: despite the damning evidence, most nations are ghosting on their methane reduction commitments. It's a planetary poker game where the house always wins, and we're all losing.

As we hurtle towards the next climate summit, it's clear that flowery pledges won't cut anymore. We need iron-clad commitments, backed by the unflinching gaze of our orbital observers in the satellites. The message is clear: in the fight for our planet's future, there's nowhere left to hide.

Space Garages and Orbital Factories: The Next Frontier in Cosmic Construction



Advances in in-orbit manufacturing and servicing–companies such as Gravitics, who build modules for orbiting factories and repair stations–are driving the move away from disposable satellites. By enabling in-orbit satellite refuelling and repairs, this development–which is backed by stricter laws and substantial investments–aims to cut expenses and waste. This has the potential to revolutionize the space sector by 2030 by turning the existing problem of space debris into a network of space-based servicing hubs.

Chinese lunar probe: Water detected in Moon samples by a Chinese lunar mission



Chinese scientists discovered signs of water in lunar soil samples that the Chang'e-5 rover had taken in 2020. The discovery, which was published in Nature Astronomy, raises the possibility that hydrated salts are present on the Moon's sunny surface. Being the first mission to return samples from a greater lunar latitude in forty years made it noteworthy. This discovery is a component of China's vast space program, which also includes ambitions to send people to the Moon and build a lunar outpost by 2030 building on the recent missions like Chang'e-4 and Chang'e-6.

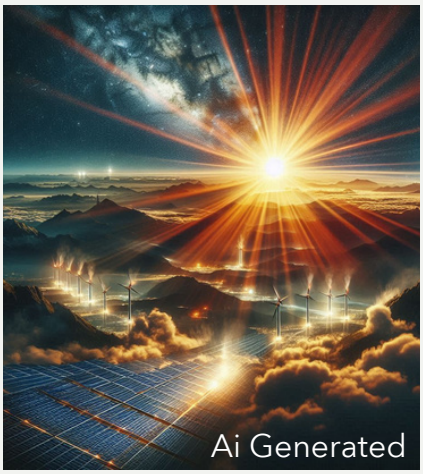
Genspace

Cover broader space news not fitting into other categories

Sunbeams from Space: The Next Frontier in Clean Energy?

Once considered science fiction, space-based solar power is becoming more realistic. This idea entails gathering solar energy in orbit and sending it to Earth as a steady supply of clean energy. Notwithstanding obstacles like creating safe and effective solar cells, recent developments like ESA's Solaris and Space Solar's CASSIOPeiA revive interest.

This idea is becoming feasible because of technological advancements and declining launch costs, which are revolutionizing the energy sector and helping to fight climate change.



AI Guardians of the Galaxy: Start-Up Takes on Space Junk Crisis

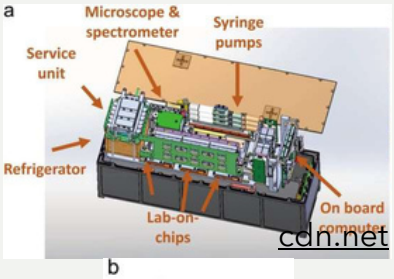
Steve Wozniak's co-founded company, Privateer, is combating space junk with artificial intelligence. Their Wayfinder platform estimates 100 million tiny pieces and tracks over 35,000 objects larger than 10cm. Privateer's AI system gives satellite operators vital alerts by forecasting orbital routes and possible collisions. With the goal of safeguarding space assets and stopping new debris, this technology offers hope for safer orbital operations in a space environment that is getting extremely crowded.



Space-Grown Crystals: The Next Frontier in Cancer Treatment

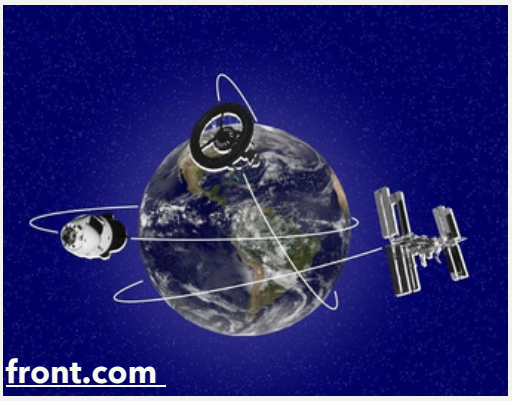
Space-based crystallization is being used by researchers to enhance monoclonal antibodies (mAbs) that are used in cancer treatment. Because mAb crystals grow more imperfectly in microgravity, there may be a reduction in adverse effects with an increase in efficacy.

This discovery may make subcutaneous delivery possible, enabling patients to self-administer medication at home. Better medicine stability, a longer shelf life, and easier accessibility in locations without cold storage are some of the advantages. This development could lead to more efficient and patient-friendly cancer treatment.





The Dawn of Private Space Stations



The era of government-led space stations is drawing to a close. With the International Space Station (ISS) set to retire around 2030, private companies are stepping up to fill the void. SpaceX, Blue Origin, and others are at the forefront of this new frontier, developing commercial space stations that promise to be both scientifically productive and commercially viable.

These private outposts will offer a variety of services, including research and development, manufacturing, and even space tourism. They could also serve as platforms for testing new technologies and developing strategies for future deep space missions. While challenges like cost, technology, and regulation remain, the potential benefits of commercial space stations are immense. As the ISS fades into history, we can look forward to a future where space exploration and commercialization go hand-in-hand.

Musk's Stellar Swarm: Starlink Dominates as Orbital Population Hits 10,000



The space above us is getting crowded. For the first time in history, over 10,000 active satellites now orbit Earth, marking a milestone in technological achievement and potential orbital congestion.

Harvard-Smithsonian astronomer Jonathan McDowell reports 10,036 functioning satellites as of July 18, 2024. This number has quadrupled in just five years, largely thanks to only one man: Elon Musk.

Magnetic Fields: The New Goldilocks Zone



The search for habitable exoplanets now includes factors beyond the "Goldilocks Zone," such as a planet's magnetic field and its interaction with the host star's magnetic field.

Any planet that circles a star outside of our solar system or is free to travel through space is known as an exoplanet, or extrasolar planet.

A study analyzing 1,546 exoplanets found only two meeting these criteria, hi ghlighting the complexity of finding Earth-like worlds.

Satell-ogies

Focus on recent and upcoming satellites and launches

Refueling Satellites: The Future of Space Dominance

The era of refuelable satellites is dawning. Recent breakthroughs in refueling technology have positioned the U.S. to lead in this critical space domain. With China and Russia rapidly advancing their space capabilities, the ability to extend satellite life and enhance maneuverability is paramount. By investing in refueling infrastructure and mandating new satellites to be refueling-capable, the U.S. can gain a decisive advantage. This strategic move will not only bolster national security but also drive innovation and economic growth in the burgeoning space industry.



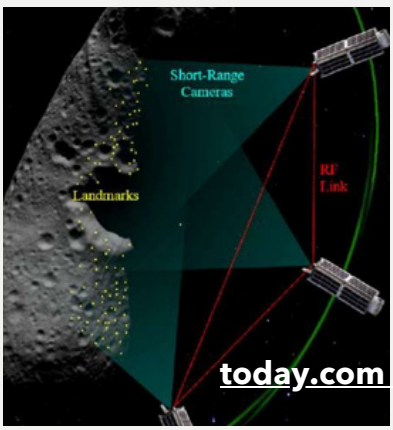
Eye in the Sky: Maxar's New Space Spies Redefine Earth Watching

Maxar Intelligence's new WorldView Legion satellites, launched in May 2024, have already delivered breathtakingly detailed images, such as counting bicycles outside San Francisco City Hall. By the end of the year, six satellites will be operational, using AI-powered analysis to provide enhanced real-time insights and revolutionize planetary observation with their high resolution. WorldView Legion could significantly advance geospatial intelligence by transforming precise mapping and tracking of rapidly changing environments.



Asteroid Paparazzi: How Tiny Satellite Swarms Could Unlock Space's Secrets

The effective orbital insertion of GOES-19 expands NOAA's fleet for weather surveillance, greatly enhancing weather observation and forecasting. By improving timeliness and accuracy, this satellite will help improve preparedness for monitoring severe weather. Meanwhile, the ANS system, which uses an unscented Kalman filter, has demonstrated promise in studies of asteroid 433 Eros. It has demonstrated the potential to transform the mapping of near-Earth objects, off-Earth resource prospecting, and asteroid characterization.



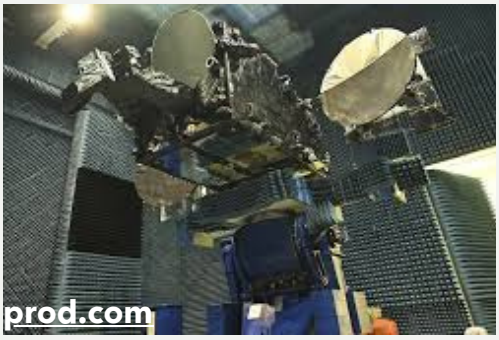
China's Eye in the Sky: Gaofen 11E Joins the Orbit Club



With the launch of the Gaofen 11E, a sophisticated remote sensing satellite, from the Taiyuan Satellite Launch Centre on a Long March 4B rocket, China's space-based surveillance system has gained a new tool. This mission, China's 33rd launch of the year, is a success and expands the fleet of over 30 satellites in the Gaofen program. Highlighting China's growing space capabilities, the Gaofen 11E will assist national defence, urban planning, disaster prevention, and monitoring the Belt and Road Initiative.

China is bolstered in the space race by this launch, which is the Long March rocket series' 528th mission.

Turkey Joins Space Elite with Homegrown Satellite



With the successful launch of Turksat 6A, the country's first communications satellite with more than 80% Turkish-made components, Turkey has achieved a significant milestone. With this accomplishment, Turkey's international space position has improved and its broadband, broadcasting, and telecommunications services throughout Europe, Asia, and Africa are strengthened.

It represents Turkey's expanding aspirations in space, encompassing prospective manned missions, lunar exploration, and next-generation satellite technologies. The project, which was created by Turkish organizations working together, demonstrates the country's capacity to oversee challenging undertakings and fortifies its industrial and technological base, promoting economic expansion and space exploration.

France's Space Tow Truck: DIANE Mission to Wrangle Spinning Satellites



Space debris management will be advanced by Thales Alenia Space's (France) DIANE mission, which intends to catch and examine a rotating tiny spacecraft by 2028. DIANE will employ a servicer spacecraft as part of the European Robotic Orbital Support Services (EROSS) program to check, decelerate, and possibly move a loss-of-control satellite.

In contrast to other experiments, DIANE will use robotics and sophisticated imagery to catch a "unprepared" satellite. This mission could open the door for regular satellite maintenance and junk removal in low Earth orbit. It is scheduled to operate for five years after demonstration.

CubeTech

Showcase innovative CubeSat missions and unique payloads

AI Firefighters: Five Smart Solutions Battling Wildfire Risks



As wildfires intensify globally, artificial intelligence is emerging as a powerful ally in prediction, prevention, and damage assessment. Here are five innovative AI solutions:

- NOBURN: An Australian app using hikers' photos to predict fire risks and severity.
- NASA's "Wildfire Digital Twin": Providing real-time monitoring and forecasting for firefighters, even in remote areas.
- CubeSat Fire Detection: AI-equipped miniature satellites capable of spotting fires 500 times faster than on-the-ground methods.
- Peatland Fire Predictor: A neural network model from Finland's Aalto University, forecasting and reducing peatland fire risks.
- DamageMap: Stanford and Cal Poly's tool for rapid post-fire damage assessment using aerial photos, boasting 92% accuracy.

These AI innovations promise to revolutionize wildfire management, from prevention to recovery. As climate change exacerbates fire risks, these smart solutions offer hope for more effective disaster risk reduction, potentially saving lives, property, and safeguarding ecosystems.

UAH Triumphs: Teams from UAH excel in the 2024 International CanSat Competition



In the 2024 International CanSat competition, the Space Hardware Club (SHC) from the University of Alabama in Huntsville (UAH) produced three outstanding teams: Shockwave, Snapdragon, and Moonracer, which were placed first, third, and fourth nationally and second, seventh, and tenth internationally.

The UAH first-year teams performed admirably, just missing out on the world championship by 0.3% in the American Astronautical Society-hosted CanSat competition. UAH SHC offered program support.

NOAA Satellite: A $113 million contract to launch an upgraded NOAA climate satellite is awarded to SpaceX.



The National Oceanic and Atmospheric Administration (NOAA) of the United States has awarded Elon Musk's business a $112.7 million contract to launch the JPSS-4 satellite on a Falcon 9 rocket from California's Vandenberg Space Force Base in 2027. Critical data for tracking Earth's weather, climate, oceans, and coasts is provided by NASA and NOAA's Joint Polar Satellite System (JPSS) program.

There are five planned JPSS satellites in the constellation, the third of which is expected to launch successfully in 2032.

Google: Free satellite connectivity may be available with the Google Pixel 9 series



According to media speculations, Google may include satellite connectivity in their next Pixel 9 series. The 'Satellite SOS' function that was momentarily accessible on Pixel phones was swiftly eliminated. It is anticipated that the new capability will enable users to send messages and share their position in places where there is no network connectivity.

Reports suggest that Pixel 9 owners will obtain satellite connectivity for free for a few years, comparable to Apple's recent strategy with the iPhone 14 and 15. However, it is unclear if older Pixel devices would receive this update. August 13 is when the Pixel 9 series is expected to be revealed.

Linked comms: Hera spacecraft trio to fly safe with inter-linked radio



A primary spacecraft and two CubeSats are part of ESA's Hera project, which is focused on planetary defence and will circle the Didymos binary asteroid system. The project will make use of new intersatellite link radio technology developed by a Portuguese business well-known for its work with unmanned aerial vehicles.

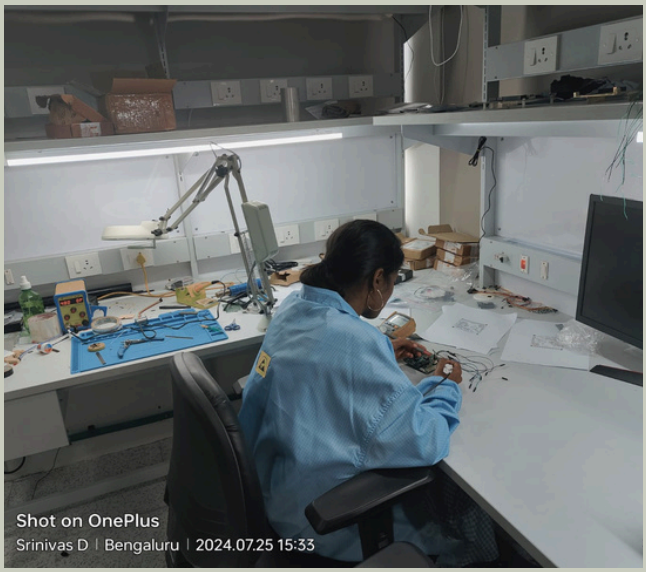
The spacecraft will be able to stay safe and communicate while doing their individual missions, thanks to this technology. The system's goal is to guarantee that all three spacecraft can successfully coordinate their missions, stay out of harm's way, and keep their correct positions.

The 75SS

Update readers on our ITCA internal space-based innovations



Establishing the model philosophy, defining the work breakdown structure, identifying subsystems, assessing make/buy possibilities, and developing manufacturing and quality plans are some of the crucial phases that make up the mission. It also includes planning tests, choosing components and materials, and outlining mission activities. Tracking progress, addressing non-conformances, and making mid-course modifications depend on ongoing validation studies and documentation. Information systems and analysis tools are available to teams to assess subsystem performance and bring in hardware or software updates. Launch readiness and mission success depend on waiver authorization, change control, and configuration management.





Space@India

Glimpses into India's space chronicle, every week

India Invests Big in Space Exploration

India's space program has received a significant boost with the Union Budget allocating ₹13,042.75 crore for the 2024-25 fiscal year.

This substantial investment follows the resounding success of the Chandrayaan-3 mission, which catapulted India into the global spotlight for its space capabilities.

To further accelerate the growth of the space sector, the government has announced a ₹1,000 crore venture capital fund.

This strategic move aims to nurture startups, attract investments, and foster innovation.

With a growing constellation of satellites and ambitious future plans, India is poised to become a major player in the global space economy.

The increased allocation underscores the government's commitment to harnessing space technology for national development and economic growth.



Chandrayaan-3



GSat6



Aditya L1



XpoSat

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Upcoming....

New Policy Paper Release: Small Satellites: Answering the call for Space Superiority

Author: Charles Galbreath, Senior Resident Fellow for Space Studies
July 25, 2024 at 12:00 PM EDT
https://mitchellaerospacepower.org

United Nations/Spain Workshop on Global Navigation Satellite Systems and Related Space Technologies in Support of Urban Sustainability Challenges

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www.itca.org.in; contact@itca.org.in

Compiled by
Er. Srinivas Durvasula
Er. S. Shanmugam
Er. Sam Benson
Er. K. Devi Sri Meenakshi

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